

An Outrigger Component for a Deployable Occulter System, Phase II

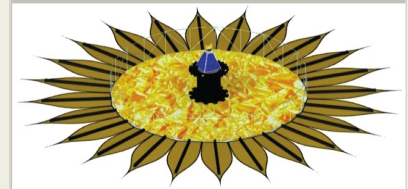
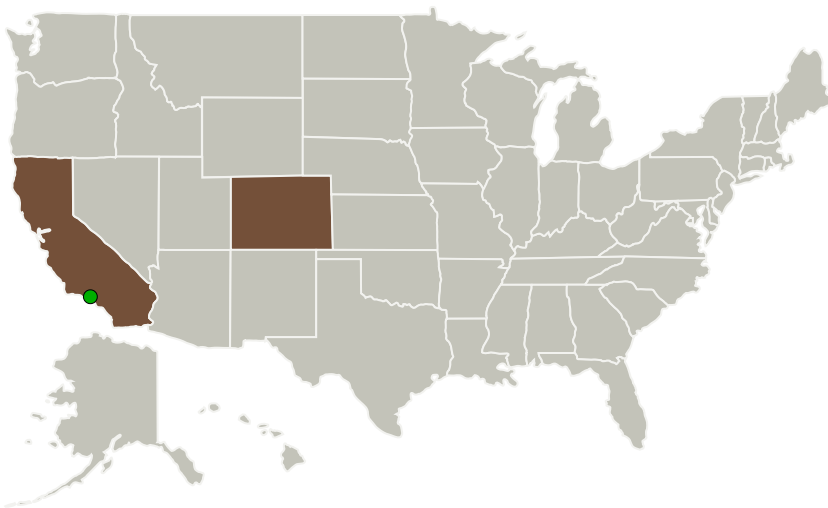


Completed Technology Project (2014 - 2017)

Project Introduction

In Phase II, Roccor proposes to build upon the results of Phase I to increase the technology readiness level (TRL) of the NASA JPL deployable external occulter. An occulter, which is a satellite flying far from a telescope and employing a large screen or, starshade, to suppress the incoming starlight, is used for detecting and characterizing exoplanets. Detecting Earthlike planets existing within the habitable zones of nearby stars is a key element of NASA's space exploration mission. The NASA JPL starshade incorporates a deployable center ring-truss as a hub and flower-like petals that wrap around the hub for packaging. As a result, it exhibits exceptionally challenging deployment kinematics. Roccor's Phase II will contribute to maturing the design of the NASA JPL deployable starshade through system and component design and analysis and supporting ground-demo hardware thereby helping to position it for spaceflight should it be transitioned to a NASA flight mission. Roccor's broad Phase II focus is on maturing each of the deployable starshade system elements that support the petals including the unfurling control system, the launch control system, and the deployed strut system. Innovative solutions have been conceptualized for each of these petal support functions as part the Phase I program. In Phase II, Roccor will emphasize developing and demonstrating the proposed petal unfurling technology culminating in a 1/3 scale fully functional and motorized hardware demonstration with 30 petal simulators, 3 of them being instrumented and strength-representative (e.g. fragile and narrow petal tips). Roccor will also further develop the launch control system and deployed strut-support system through extensive design and analysis.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
Roccor, LLC	Lead Organization	Industry	Longmont, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

Project Transitions

▶ **April 2014:** Project Start

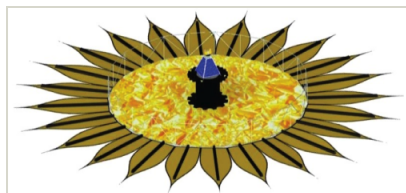
✓ **August 2017:** Closed out

Closeout Summary: An Outrigger Component for a Deployable Occulter System, Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137645>)

Images



Briefing Chart Image

An Outrigger Component for a Deployable Occulter System, Phase II

(<https://techport.nasa.gov/image/133303>)



Final Summary Chart Image

An Outrigger Component for a Deployable Occulter System, Phase II Project Image

(<https://techport.nasa.gov/image/126355>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Roccor, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

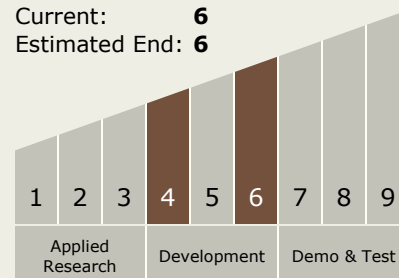
Carlos Torrez

Principal Investigator:

William Francis

Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.2 Structures and Antennas

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System